



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,020	12/21/2001	Joydeep sen Sarma	112056-0006	1111
24267	7590	02/27/2006	EXAMINER	
CESARI AND MCKENNA, LLP 88 BLACK FALCON AVENUE BOSTON, MA 02210			CHUNG, JI YONG DAVID	
			ART UNIT	PAPER NUMBER
			2143	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/027,020	SARMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ji-Yong D. Chung	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

900

## DETAILED ACTION

### *Response to Remarks*

1. The applicant's arguments and amendments filed on November 28, 2005 have been carefully considered but they are not deemed fully persuasive. The discussion of Applicant's arguments follows.

#### Claim Rejection – 35 U. S. C. 102

The applicant's argument are threefold (1) that Gross is silent concerning the limitation "changing ownership of information stored in each of the plurality of disks to an un-owned state" and "changing ownership of information stored in each of the plurality of disks to a state of destination file server ownership." (2) Grossman teaches away from the "changing ownership information stored in each of the plurality of disks" and (3) Claims 10-15 are not substantially the same as claims 1-3, because the claims 14 and 15 cite "predetermined sector of the disk" and "a changing small system interface level 3 reservation of the disk."

In response to the applicant's first argument, the Examiner directs applicant's attention to the operation of vgexport and vgimport. Contrary to what the applicant suggests (i.e., vgexport does not modify the ownership information on the disks), vgexport does modify the disks that are exported; it writes such information to the disks. See the example source code listing for vgexport, given in the document vgexport.c. The source code is part of an open-source logical volume manager library available for Linux and it explains what functions vgexport implements. The document is not relied upon as prior art, but as evidence in support of the view that vgexport

Art Unit: 2143

writes “ownership” information to the disks. In the document `vexport.c`, see the static function `vgexport_single`, which includes `vg_write(vg)`. The function `vg_write` writes “ownership” information “vg” to the disks.

The logical volume manager (LVM) on Linux implements the representative functional capabilities of other UNIX flavors of LVM.

As for the applicant’s second argument (i.e., Gross teaches away from the changing ownership information”), the Examiner notes that the applicant misinterprets the Grossman’s statement “volume group information and data is untouched on the physical volume.” What source code listing shows is that the volume group information and data are not modified, but the *ownership information* (e.g., See `vg->status != EXPORTED_VG` in `vgexport.c`) is indeed modified.

The applicant’s third argument is that the limitations “predetermined sector of the disk” and “a changing small system interface level 3 reservation of the disks” have not been considered. The Office’s response is that they have been considered, and these limitations do not add substantively to the claims, thus, the claims 14 and 15 cite substantively the same limitations as the claims 1-3.

As for “predetermined sector of the disk,” the Examiner notes that the adjective “predetermined” is ambiguous. It is not clear when the sector is “predetermined.” If the sector is predetermined prior to the removal of the ownership, then, Grossman’s `vgexport` meets the requirement. The sector, to which data is written, is certainly “predetermined”; it is computed

Art Unit: 2143

before the ownership information modification. In addition, the “sector” is applicable to every disk that is manufactured. In summary, the phrase “predetermined sector of the disk” does not add any meaningful limitation as it is applied to vgexport.

As for “changing small system interface level 3 reservation of the disks” is not mentioned or defined in the specification; it is meaningless in the context of the claim. The limitation “means for changing small computer system interface level 3 reservation of the disk to an un-owned state” just translates to “means for changing disk to un owned state,” again, which has been discussed in the context of claims 1-3.

In view of the above, contrary to the applicant’ assertion “Gross is legally insufficient to anticipate the present claims under 35 U. S. C. 102, the Examiner is compelled to sustain the original grounds of rejection.

#### Claim Rejection of claims 4-7 under 35 U. S. C. 103

##### (a) Reliance on Inherency.

The applicant argues, “it is improper to consider UNIX commands ‘vgremove’ and ‘vgcreate’ inherent to the cited references since they are not necessary part of these references. Indeed, there is no suggestion that the functionality of the commands is even applicable to the cited references.”

The Examiner maintains that vgremove and vgcreate *are inherent* part of a logical volume manager, which is part of Gross. All logical volume managers include the commands vgremove and vgcreate. The Examiner directs the applicant’s attention to the source file listing

Art Unit: 2143

for the logical volume manager, which includes vgremove and vgcreate. See “Contents of LVM2.201.15.tar.” LVM2.201.15.tar is a listing of files that are included in the source distribution of logical volume manager.

(b) Reliance of Ordinary Skill

The applicant argues that the Examiner “appears to rely on ‘ordinary skill’ in the art, without citation to reference, in discussion of UNIX ‘vgremove’ and ‘vgcreate’ commands that allegedly make obvious the current claims.” The point here seems to be that the applicant challenges “common knowledge” of vgremove of vgcreate, to which the Examiner must supply evidentiary support.

A copy of source code for ‘vgremove.c’ and ‘vgcreate’ are provided to support the Examiner’s contention. As it is plainly evident, they are part of LVM library that is common for implementing disk management system many variants. One of ordinary skill in the art would certainly be aware of its implementation techniques.

To the applicant’s argument that “without citation to documentary evidence the exact nature of the rejection is unclear,” the Examiner notes that most UNIX flavors implement the same LVM core concepts and techniques. It does not matter which flavor of UNIX LVM the applicant cites.

It is noted that the Examiner’s arguments regarding vgremove and vgcreate are not based solely on the Examiner’s experience, as the provided documentary evidence indicates.

Art Unit: 2143

(c) Reliance of the Prior Art

In reference to claim 4, the applicant's argument here is that “

while the Applicant claims steps for transferring ownership of a volume, Gross discloses (deleting) a logical volume with a UNIX “lvremove” command. If a logical volume is deleted, all data in the volume is destroyed. Clearly, a deleted volume whose data has been destroyed may not thereafter be transferred in a transfer process. Further, Matsunami merely describes allocating and resizing storage areas on disks and is silent concerning transferring ownership in a transfer process [pg. 19, Remarks]

In response, the Examiner notes that the claim says nothing about destroying or not destroying the information on the disks. It merely refers to changing the disk ownership, not information on the disks. Should the applicant wish to argue the above point, the claim should cite the features in accordance with it.

The applicant is missing the point of the rejection. The point here is that when one is manipulating disks using the logical volume manager, disks can be transferred from one server to another by issuing a series of commands. In fact, the commands exist precisely in order to facilitate one to redeploy disks of one server, when the disks are no longer used, for another server.

Claims Rejections of claims 16-25 under 35 U. S. C. 103.

The applicant here repeats the arguments that have been presented before. They have been addressed above.

Art Unit: 2143

Claim Rejections of claim 8 under 35 U. S. C. 103

As has been mentioned in the prior Office action, most of the limitations of claim 8 have been already discussed in reference to claims 4-7. Comparing claim 8 to claims 4-7 clearly shows that the limitations of claim 8 borrow from claims 4-7.

The applicant's argument seems to be, in view of the above, is that Delaney discloses journaling of changes to the file systems and storing a journal to media in general, but lacks teaching of how such journaling could be used in a transfer of ownership of disks.

Contrary to what applicant says, claim 8 does not relate how logging is related to the transfer of disks at all. It merely mentions that there are three loggings.

As written, the claim thus reads on the combination of the cited references and Delaney, because the execution of any of the LVM commands within the journal file system would be accompanied by logging (i.e., 'journaling') of any changes to the files. Such changes are not related to transfer of the disks, but nonetheless, "logging" (i.e., 'journaling') exists. Note that in the combination, the logical volume manager commands would have been implemented using journal file system.

To put it differently, claim 8 cites logging in addition to the limitations of claims 4-7, but does not indicate how that logging is related to change in file ownership. \

***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.



Art Unit: 2143

3. **Claims 1-3, 9-15, and 26** are rejected under 35 U.S.C. 102(e) as being anticipated by Gross et al (Pat. No. 6,128,734, Gross hereinafter).

With respect to **claim 1**, Gross shows a method of *transferring ownership of a volume comprising the steps of:*

*changing ownership information stored in each of the plurality of disks to an un-owned state from a state of source tile server ownership [See vgexport command on lines 49-55, column 9];*

*changing ownership information stored in each of the plurality of disks to a state of destination file server ownership from the un-owned state [See vgimport command on lines 49-55, column 9].*

With respect to **claim 2**, Gross shows *the step of changing ownership of the plurality of disks to an un-owned state further comprises the steps of:*

*changing a first ownership attribute of the disks to an un-owned state [See lines 55-60, column 9. The vgexport removes /dev/volume\_group from /etc/lvmtab file]; and*

*changing a second ownership attribute of the disks to an un-owned state [See lines 55-60, column 9. The vgexport removes the device files associated with /dev/volume\_group from the system].*

With respect to **claim 3**, Gross shows *the step of changing ownership information stored in each of the disks to a destination file server further comprises the steps of:*

Art Unit: 2143

*changing a first ownership attribute of the disks to a destination tile server state* [See lines 1-12, column 10. The vgimport adds /dev/volume\_group to /etc/lvmtab file]; and

*changing a second ownership attribute of the disks to a destination file server state* [See lines 1-12, column 10. The vgimport adds the devices files associated with /dev/volume\_group to the system].

With respect to **claim 9**, Gross *shows a method of transferring ownership of a volume having a plurality of disks comprising the steps of:*

*writing a first log file to record a first part of a transfer process;* [The vgexport causes lvmtab file to be rewritten. The first part of transfer process is therefore recorded in lvmtab. The file system is no longer within the system; therefore it is in “un-owned” state. See lines 55-60, column 9]

*performing the first part of the transfer process , the first part of the transfer process being changing ownership informationed stored on each disk of the volume from a source server to an un-owned state* [The vgexport removes device files. The removal causes the system to no longer “own” the file system, as the file system no longer exists on the server. See lines 55-60, column 9];

*writing a second log file to record a second part of the transfer process* [The vgimport causes /dev/volume\_group to be written. File volume\_group serves as a “log,” which serves as a record of transactions. See lines 1-12 in column 10. Note that volume\_group also serves as a configuration file]

Art Unit: 2143

*performing a second part of a transfer process, the second part of the transfer process being changing ownership information stored on each from the un-owned state to a destination server.* [The vgimport cause lvmtab to be rewritten. The file system is imported, and is thus “owned” by the system. See lines 1-12, column 10]

**Claims 10-15** incorporates all the limitations of claims 1-3, but in computer product form and apparatus form rather than in method form. The reasons for the rejections of claims 1-3 apply to claims 10-15. Therefore, claims 10-15 are rejected for substantially the same reasons.

With reference to **claim 26**, Gross shows “the ownership attribute” is *stored on a predetermined sector of each disk*. As indicated in the above Response to Remarks, the feature is inherent in the vgexport or vgimport. Metadata information is stored on each of the disks. Too see this, examine the vgexport.c. One can see that vgexport invokes vg\_write. Vg\_write can be found in metadata.c. Looking at the source code, vg\_write applies metadata to each of the “meatadata areas” (each of which are on disks).

### ***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 4-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross in view of Matsunami et al (Pub No.: 2002/0099914, Matsunami hereinafter).

Art Unit: 2143

With respect to **claim 4**, Gross shows:

*sending a first message to a source file server, the message containing a request for transferring ownership of a volume of disks* [ See lvremove command on lines 35-38, column 4. The command is in UNIX. Removing the group removes the ownership of the volume, because it removes the volume];

*receiving a response from the source file server* [It is inherent in the execution of lvremove command to give a response, which would then be transmitted back to the client];

*if the response contains abort information, aborting the transfer* [If the command were unable to execute, lvremove has inherent capability of generating an error message, in which case any further steps for disk transfer cannot execute. The aborting capability (or sending an abort message) is inherent in lvmremove].

*if not, verifying that the volume can be transferred* [Each LVM commands has internal error checking. When a string of them is executed, the last one serves as the step for “verifying.” If any of the steps fails, the overall execution fails (“aborts”)];

*if the volume can be transferred, sending a second message to the source file server to perform the first part of a transfer process to transfer ownership from the source file server to an un-owned state* [vgremove can be used. vgremove is one of the commands inherent in LVM];

*receiving a response from the source file server after it performed the first part of the transfer process* [the execution of LVM manager command, vgremove generates either error message or a successful return message. The feature is inherent in LVM.]; and

*in response to the step of receiving, performing a second part of a transfer process to transfer ownership from the un-owned state to a destination file server [vgcreate is one of the commands inherent in LVM].*

Gross does not show each of the above steps in combination.

Matsunami, however, shows a network environment in which disk transfer maybe made from one server to another.

It would have been obvious to one of ordinary skill in the art at the time of the invention to remove a set of disks from one server and to reallocate it to another, because the reallocation allows one to reuse disks.

In addition, it also would have been obvious to one of ordinary skill in the art at the time of the invention to sequence the steps given above in order to move physical volumes from one server to another. Moving the disks *requires* the following steps (which are the summary of the steps in the claim) to be executed in proper sequence. (1) transmission and reception of commands from a client station (2) the removal of all LVs (vgremove will generate an error if there are any logical volume which exists on the volume group) (3) the removal of the volume group and physical volumes, and (4) recreation of volume groups, using the same physical volumes, in another server. They must all be executed; otherwise, volume transfer would not work.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use LVM commands (either inherent or otherwise) given in Gross with Matsunami's system, because, as it is shown in Fig. 11, LVM (item 252) is part of Matsunami's system. The Management Console (301) can generate (either via scripting or user input) proper LV

Art Unit: 2143

commands to LVM on the server, to release the disks to be transferred, as explained for removing a volume and to install the disks on a different server.

With respect to **claim 5**, Gross's LVM has commands that are inherent and meet the following limitations:

*changing a first ownership attribute of the disks to a destination file server state*

[vgcreate, part of LVM, creates the volume information on the disks].

Matsunami shows

*changing a second ownership attribute of the disks to a destination tile server state.*

Matsunami shows the feature that reads on "second ownership attribute." See WWN in Fig. 3 of Matsunami. It must be set to a new ownership value upon setting a new host server.

With respect to **claim 6**, Matsunami shows steps of:

*verifying that the disks can be transferred in response to an initial request from a destination file server* [The management console is opened at a server, as it can be at any terminal. See Fig. 7 for forming disk pool that can be used. The execution of the management console would send the first message from the server];

*sending an acknowledgement by the source file server to the destination file server* [See paragraph 0071 The server name is entered to LUN forming program interface, which communicates to the destination server];

*receiving a second request from the destination file server* [See paragraph 0071. The server sends a response back];

*aborting if the second request contains abort information* [The paragraph 0078 speaks of preventing access conflict];

*changing the volume to an off-line status in response to the second request not containing abort information* [Removing a volume group from the source server (See the discussion of claim 5, in reference to part of limitation that reads on Gross) makes it “off-line.” ]

*performing a first part of a transfer process, the first part of the transfer process being transferring ownership of the source file to an un-owned state* [See the discussion of claim 4 above in reference to part of the limitation that reads on Gross]; and

*sending a message to the destination file server to prompt a second part of the transfer process, the second part of the transfer process being transferring ownership from the un-owned state to the destination server* [See 0095. Pool manager sends notice to the pool management agent. See the discussion of claim 4 for relevant part of the limitations that reads on Gross].

With respect to **claim 7**, Gross’s LVM has commands that are inherent and meet the following limitations:

*changing a first ownership attribute of the disks to an un-owned state* [pvremove removes the LVM information on the disk].

Matsunami shows *changing a second ownership attribute of the disks to an un-owned state*.

Matsunami shows the feature that reads on “second ownership attribute.” See WWN in Fig. 3 of Matsunami. See paragraph 0078, which talks about erroneous deletion. Upon deletion, WWN must be set to null to indicate availability.

6. **Claims 16-25** are rejected under 35 U. S. C. 103(a) as being unpatentable over Matsunami, in view of Delaney et al. (Pub. No. 2003/0097611, Delaney hereinafter)

With respect to **claim 16**, Matsunami does not show, but Delaney shows, journal (“writing changes to a log file”). The journal is written automatically for the changes that are made to the file system.

Matsunami shows a method comprising:

*changing a first attribute of ownership from source server ownership to an un-owned state* by writing the change to a log file and *rewriting the first attribute of ownership on the disk* [vgremove command using LVM on Matsunami causes attached disks to be no longer associated with a server (“changing a first attribute of ownership from source server ownership to an un-owned state”). Vgremove removes metadata actually on a disk to be removed. The erased ata contains physical volume information for the first server. The first physical volume information is “first ownership attribute”].

*changing a second attribute of ownership from source ownership to an un-owned state* by writing the change to a log file and *rewriting the second attribute of ownership on the disk* [vgremove command using LVM on Matsunami causes attached disks to be no longer associated with a server (“changing a second attribute of ownership from source server ownership to an un-owned state”). Vgremove removes metadata actually on a disk to be removed. The erased ata contains logical volume information for the server. The logical volume information is “the second ownership attribute”].



*changing the first attribute of ownership from the un-owned state of ownership to destination server ownership* by writing the change to a log file and *rewriting the first attribute of ownership on the disk* [vgcreate command using LVM on Matsunami causes attached disks to be associated with a server (“changing the first attribute of ownership from the un-owned state of ownership to destination server ownership”). Vgcreate writes metadata onto volume to be owned. The written data contains physical volume information for the server. The physical volume information is the “first ownership attribute”]; and

*changing the second attribute of ownership from the un-owned state to destination server ownership* by writing the change to a log file and *rewriting the second attribute of ownership on the disk* [vgcreate command using LVM on Matsunami causes attached disks to be associated with a server (“changing the second attribute of ownership from the un-owned state of ownership to destination server ownership”). Vgcreate writes metadata onto the volume to be owned. The written data contains logical volume information for the server. The logical volume information is the “second ownership attribute”].

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate journaling to recycle network disk drives, to reuse available disk resource, and therefore, to remove disks from one server and to move it to another.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate journaling (as shown in Delaney) to recycle network disk drives, so that the recycling process would be recoverable in case of failure. The whole purpose of having a journal is to for recovery, as stated in Delaney paragraphs 003-004.

Art Unit: 2143

With regard to **claim 17**, Delaney speaks of recovery in the event of recovery using the log (See paragraph 003 and 004). Matsunami shows the basic framework for disk reallocation (“transfer ownership.”)

It would have been obvious to one of ordinary skill in the art at the time of the invention to transfer ownership utilizing the log, because using Delaney and Matsunami, (1) one would be able to recover the system after a failure and (2) one would be able to repeat the earlier procedure of disk transfer using the recovered system. The motivation is simple: to complete the transfer of the disks that was attempted prior to the interruption caused by the failure.

**Claims 18 and 19** substantively incorporate the limitations of claims 16 and 17, but in apparatus form rather than in method form. The reasons for the rejections of claims 16 and 17 apply to claims 18 and 19.

In reference to **claims 20**, its scope is broader than that of claims 18. As shown by dependent claims 24-25, limiting “first computer” and “second computer” as “the source server” and limiting “third computer” and “fourth computer” as “destination server” will define a claim whose scope maps substantively to claim 18. Thus, the reasons for the rejections of claims 18 apply to claims 20.

**Claim 21** substantively incorporates the limitations of claim 19. The reasons for the rejections of claim 19 apply to claim 21.

Art Unit: 2143

In reference to **claims 22 and 23**, Matsunami shows all of the elements of claims 22 and 23, including the one “destination server” / “single computer.” See Fig. 1.

It would have been obvious to one of ordinary skill in the art at the time of the invention to return a given set of disks to a pool, and then, based upon later need, to reacquire the disks for other projects, for a single computer. The motivation for cycling resource is to maximize disk availability to servers that need them.

**Claims 24 and 25** substantively cite limitations that are broader than those of claim 18. The reasons for rejection of claim 18 apply to claims 24 and 25.

7. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunami and Gross and further in view of Delaney.

In reference to **claim 8**, except for the steps regarding log files, all of the elements of the claim have been discussed with respect to claims 4-7.

Neither Matsunami nor Gross shows the following:

*writing a first destination log tile;*

*writing a first source log file;*

*writing a second destination log file;*

*writing a second source log file;*

*writing a third source log file;*

*writing a third destination log file; and*

*erasing the previously written logs.*

Delaney shows logging associated with volume creation and volume destruction. See paragraphs 003 and 004. In the preceding combination of Matsunami, Gross and Delaney, the log would be written at both the destination and the source servers and then erased when the written logs are filled up.

It would have been obvious to one skilled in the art at the time of the invention to log file system transactions in a log file, because as Delaney explains in paragraph 002, the logging (journal) would make the system more reliable and stable in the event of a system problem.

8. **Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gross in view of Black (Pat. No. US 6,708,265).

Gross shows a part of *the second ownership attribute is a small computer system interface (SCSI) persistent reservation tag*. Vgexport, vgimport and other LVM commands have a built-in locking feature. However, Gross does not show SCSI.

Black shows LVM (a variant of UNIX) and SCSI (See lines 1-3, in column 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the LVM, as mentioned in Gross, to SCSI interface, including the locks. The motivation to use the locks is to prevent write inconsistencies when clients request multiple, concurrent disk write accesses.

Art Unit: 2143

The suggestion for using LVM together with SCSI is given in Black. See the discussion of LVM in the "Discussion of the Related Art." Black's system is all about LVM. Black mentions the use of SCSI in that context (See lines 1-3, in column 7).

***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

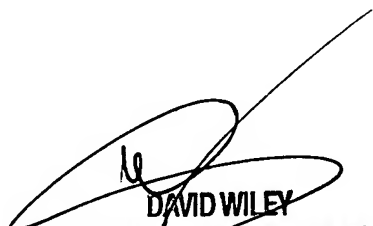
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ji-Yong D. Chung whose telephone number is (571) 272-7988. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2143

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ji-Yong D. Chung  
Patent Examiner  
Art Unit: 2143



DAVID WILEY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100

qpc